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**ALCOHOL DEPENDENCE SCALE
(ADS)
USER'S GUIDE**

Harvey A. Skinner, Ph.D.
Addiction Research Foundation

and

John L. Horn, Ph.D.
University of Denver

Addiction Research Foundation
Toronto



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Ideas about alcohol dependence and addiction to alcohol have been discussed for years (Keller, 1976; Lender, 1979). Recently, a refined definition of the alcohol dependence syndrome has supplied a particularly important catalyst for alcoholism research and clinical practice. The Alcohol Dependence Scale (ADS) was developed to provide a brief but psychometrically sound measure of this syndrome. The ADS was designed for use in various settings as both a research and clinical diagnostic tool. The aims of this manual are (1) to review important developments in the alcoholism literature regarding the concept of alcohol dependence, (2) to describe the reliability and validity of the ADS based on a major evaluation study, and (3) to provide instructions for the administration, scoring, and interpretation of the ADS.

I. BACKGROUND

In his classic text, The Disease Concept of Alcoholism, Jellinek (1960) distinguished among several "species" of alcoholism. He defined Alpha alcoholism as purely psychological dependence, where alcohol is used to relieve bodily or emotional distress. People who use alcohol in this way are able to moderate their consumption levels, and there is no evidence of a progressive process. In contrast, Gamma alcoholism is marked by loss of control over alcohol intake, by an increased tolerance to alcohol, and by withdrawal symptoms due to physical dependence. Generally, Gamma alcoholics experience a progression from psychological to physical dependence, with the development of serious medical and psychosocial consequences. They are typically binge drinkers. Members of Alcoholics Anonymous regard this kind of drinker as "alcoholic." Delta alcoholism in Jellinek's system is defined by an increased tolerance and by withdrawal symptoms, but instead of binge drinking - loss of control, there is an inability to abstain. Delta alcoholics can moderate the amount of alcohol consumed, but generally are not able to abstain for more than a brief period. In contrast, Gamma alcoholics tend to lose control over the amount consumed during a given drinking session, while they have the ability to abstain and determine when a new drinking bout will be initiated.

Thus, a major distinction made by Jellinek (1969), and recognized by many other insightful clinicians as well, is between drinkers who lose control over the amount consumed during a given drinking session but have at least some ability to abstain and determine when a new drinking bout will be initiated, and drinkers who, while not (necessarily) showing glaring loss of control on any given occasion, are

nevertheless unable to abstain from drinking on a daily basis. These two patterns have been distinguished in factor analytic studies of diverse sets of symptoms (Horn et al., 1974; Skinner, 1981b). The daily drinking pattern is characterized by withdrawal symptoms if abstinence is attempted. The other pattern is indicated by compulsive binge drinking followed by severe withdrawal symptoms and a period of abstinence. In summary, we see two forms of loss of control. We will refer to these as "binge loss of control" and "addictive loss of control."

The idea of "loss of control," particularly in binge drinking, is often oversold, perhaps especially by adherents to Alcoholics Anonymous. Difficulties have been revealed with both the conceptualization and measurement of this kind of loss of control (Merry, 1966; Clark, 1975; Marlatt, 1978). There are research indications that loss of control need not be complete, and that psychological and social factors are key moderating variables. Mello and Mendelson (1971) showed that when heavy drinkers were given the opportunity to work for alcohol, they frequently abstained for substantial periods in order to accumulate enough alcohol to sustain their next binge. This is perhaps characteristic of binge drinking. Gottheil et al. (1972) demonstrated in an experimental drinking program that alcoholics could taper consumption during the final weeks of the study in order to avoid withdrawal symptoms (Gottheil et al., 1972). Thus, rather than speaking of loss of control in binge drinking as an all or none phenomenon, existing research indicates the need for a concept of "impaired control," where the consumption of a few drinks is just one of many factors that can lead to excessive drinking.

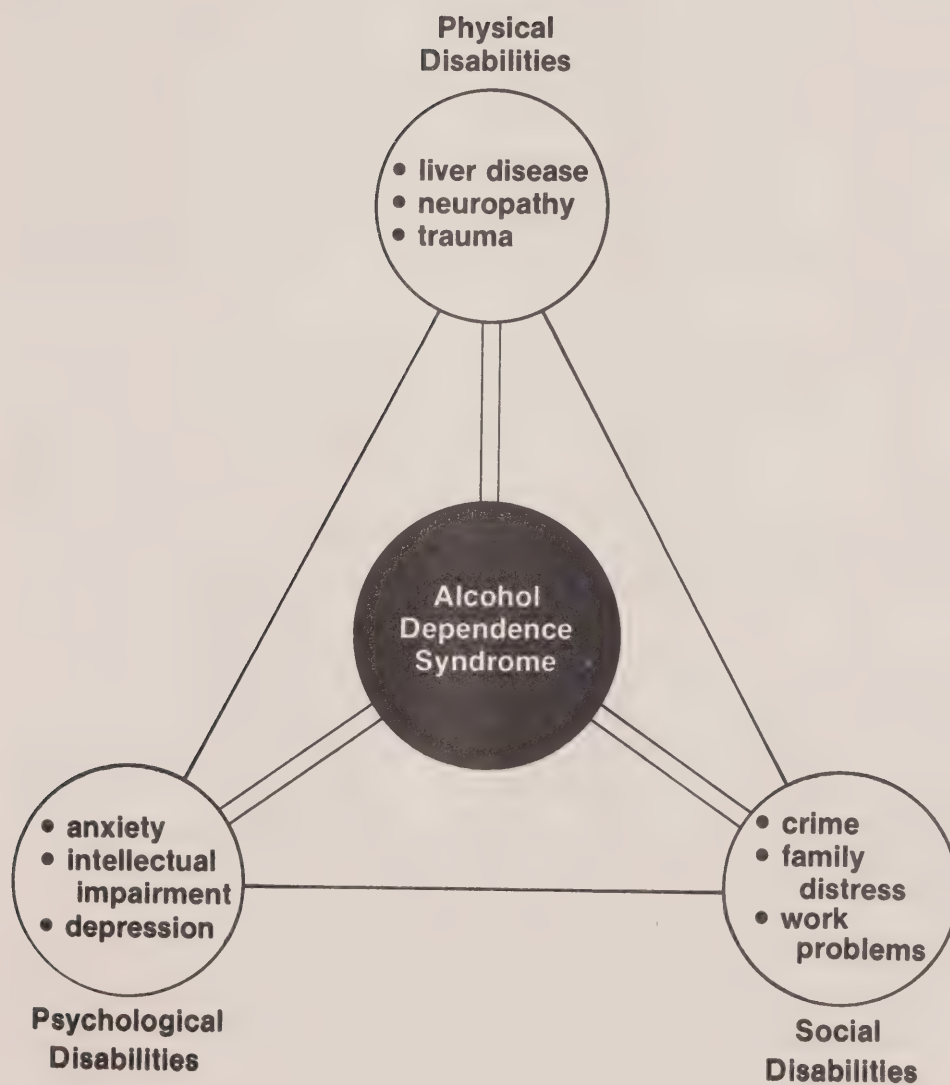
Alcohol Dependence Syndrome

A concept of "impaired control" is a major symptom of the alcohol dependence syndrome described by Edwards and Gross (1976) and further elaborated on in a World Health Organization (WHO) Task Force Report (Edwards et al., 1977). Other aspects of the syndrome include: increased tolerance to alcohol, repeated withdrawal symptoms, awareness of a compulsion to drink excessively, reinstatement of the syndrome after abstinence, and salience of drink-seeking behavior. These elements will not always be present with the same magnitude, and different manifestations of the syndrome may arise due to modifying personal and environmental factors.

A number of physical, psychological, and social disorders stem directly and indirectly from excessive drinking. In the WHO system, these alcohol-related disabilities are distinguished from the core dependence syndrome (Figure 1). Both

FIGURE 1

Differentiation from Alcohol-Related Disabilities



the dependence syndrome and alcohol-related disabilities are viewed as existing in degrees rather than as an all-or-none state. This emphasis on quantitative variation among individuals distinguishes the WHO concepts of diagnosis from the categorical diagnoses of the American Psychiatric Association's (1980) new diagnostic system (DSM-III).

In the section on substance-use disorders in the DSM-III system, a distinction is drawn between "alcohol abuse" and "alcohol dependence." The essential feature of alcohol abuse is a pattern of pathological use of alcohol for at least one month that causes impairment in social or occupational functioning. The definition of pathological alcohol use includes the need for daily drinking, inability to cut down or stop drinking, binges (remaining intoxicated throughout the day), repeated efforts to control or reduce excess drinking, and continuation of drinking despite a serious physical disorder that is exacerbated by alcohol use. These elements parallel the WHO concepts of impaired control over alcohol use. Alcohol dependence in the DSM-III system is marked by the features of alcohol abuse and additionally by either tolerance or withdrawal.

Estimates suggest that around 5% to 7% of the male population of North America may meet criteria for alcohol dependence, as indicated by symptoms of withdrawal and impaired control over drinking (Polich, 1981). But, of course, many people have "drinking problems" without dependence. The prevalence of nondependent alcohol abuse has been estimated to be between 15% and 35% of the male population of the United States (Cahalan, 1970). These problem drinkers tend to be more prevalent among young males, where alcohol-related disorders are often linked to acute episodes of intoxication.

The WHO distinction between a core dependence syndrome and alcohol-related disabilities has important implications for assessment and treatment planning. For example, on entry to a hospital Emergency Department, a patient may display a traumatic injury that is due to excessive drinking. Typically, such a patient receives help only for that injury; no attention, at the time or even subsequently, is given to the person's alcohol dependence, which may be the key determinant of the traumatic injury (Holt et al., 1980). Systematic assessment of alcohol dependence in clinical settings could provide a basis for treatment that might prevent future traumatic injuries and medical complications. Thus, an adequate assessment requires a measure of alcohol dependence as well as screening for alcohol-related disabilities. Treatment can then focus on altering patterns of excessive alcohol use, or on disabilities related to drinking, or both.

There is some evidence to suggest that psychological and physical forms of dependence may emerge in a developmental sequence--the psychological pattern appearing as a precursor to a physical dependence syndrome (e.g. Jellinek, 1960; Mulford, 1977). Case histories suggest, for example, that both the patients who show binge loss of control and those who show addictive loss of control were, at an earlier period in their lives, merely "psychologically involved" in the use of alcohol: they drank in order to be part of social activities, to overcome shyness, to deal with depression, etc. Usually there was a rather gradual transition from early occasional intoxications to bouts of intense intoxication, lasting over increasingly longer periods of time. Then, efforts to reduce the uncomfortable features of such intense intoxication led to either the binge pattern or the addiction pattern of impaired control over drinking.

The Alcohol Dependence Scale provides a brief measure of the extent to which the use of alcohol has progressed from psychological involvement to impaired control. A more comprehensive assessment of drinking styles and related disabilities may be obtained using the multiple-scale Alcohol Use Inventory (Horn et al., 1983).

Although the concept of an alcohol dependence syndrome has not escaped criticism (Shaw, 1979), this criticism does not discount evidence supporting the predictive utility of good measures of the syndrome. The degree of alcohol dependence has been found to be correlated with failure to achieve a controlled drinking goal, as well as with the priming effect of alcohol (Hodgson et al., 1979; Hodgson, 1980a). There is evidence to indicate that such a syndrome can be regarded as unidimensional (Chick, 1980a; Skinner, 1981b), and that there is a sequential development of the symptoms on this dimension (Chick and Duffy, 1979). Research also indicates the utility of the syndrome to distinguish among clients of various inpatient and outpatient treatment programs (Skinner, 1981a).

Other evidence suggests that the level of alcohol dependence can substantially influence the likelihood of maintaining controlled drinking. Polich et al. (1980) found that older (over 40) individuals, who were highly dependent on alcohol at the time of intake assessment, had a lower relapse rate at the four-year follow-up if they had achieved a stable period of abstinence (six months or more) during the first 18 months of follow-up. In contrast, younger individuals who were less dependent on alcohol at intake had a lower relapse rate at the four-year follow-up if they had obtained a controlled drinking status during the first 18 months. Orford et al. (1976) found at a two-year follow-up that abstainers were more likely to have been

diagnosed at intake as physically dependent on alcohol (Gamma alcoholics), whereas controlled drinkers were usually diagnosed at intake as psychologically involved with the use of alcohol (Alpha alcoholics). Mulford (1977) also found that a good proportion of patients at an early stage (i.e. I) in the dependence process achieved socially acceptable drinking at follow-up. However, a steep decline in rates of social drinking was observed for patients at later stages (i.e. II to IV) of alcohol dependence.

These results underscore the importance of assessing the extent of alcohol dependence when helping a client set goals of either abstinence or controlled drinking. Goals of moderation or controlled drinking may be appropriate for younger individuals who score low on alcohol dependence; abstinence goals appear to be more suitable for individuals at advanced levels of alcohol dependence, particularly if these individuals are over the age of 40. Other important factors that must be considered when deciding between goals of abstinence and controlled drinking are discussed by Miller and Caddy (1977), Horn (1978), and Miller (1983).

Development of the Alcohol Dependence Scale (ADS)

The Alcohol Dependence Scale (ADS) and its parent instrument, the Alcohol Use Inventory, have evolved from a comprehensive series of factor analytic studies over the past 25 years (Horn and Wanberg, 1969, 1970; Wanberg and Horn, 1970, 1983; Wanberg et al., 1973, 1977; Horn et al., 1974; Horn, 1978; Skinner, 1981b). This research has supported a multidimensional concept of alcoholism that includes several rather different styles of alcohol use, various biomedical and psychosocial consequences of excessive drinking, as well as perceived benefits from alcohol use (Wanberg and Horn, 1983). The 147-item Alcohol Use Inventory (Horn et al., 1983) was developed to measure these dimensions. The Alcohol Use Inventory contains 16 primary scales which tap specific areas, such as withdrawal symptoms. The 16 primary scales resolve into six higher order scales that measure broad dimensions of alcohol use and deterioration.

In a factor analytic study of the Alcohol Use Inventory, Skinner (1981b) identified a general factor that measures the alcohol dependence syndrome as discussed by Edwards and Gross (1976). The following four Alcohol Use Inventory scales were salient markers of this factor: (1) Loss of Behavioral Control, (2) Psychophysical Withdrawal Symptoms, (3) Psychoperceptual Withdrawal Symptoms, and (4) Obsessive-Compulsive Drinking Style. The 29 items from these four scales were combined into a single instrument to make a provisional version of the Alcohol

Dependence Scale that was evaluated in a major study by Skinner and Allen (1982). Further item analysis research led to the current 25-item Alcohol Dependence Scale, which is operationally equivalent to the provisional 29-item version.

II. MEASUREMENT PROPERTIES

A major evaluation of the ADS was conducted by Skinner and Allen, and published in The Journal of Abnormal Psychology (1982). In this study, it was found that the ADS is reliable and correlates in predictable ways with clinic attendance, physical symptoms, and psychosocial problems. The reader should consult the article for a detailed description of the findings.

The sample of the Skinner and Allen study consisted of 225 individuals who had voluntarily sought assistance for alcohol problems at the Clinical Institute of the Addiction Research Foundation, Toronto. Clients were assessed on an outpatient basis before entering specialized treatment programs. Age ranged from 15 to 65 years with an average of 38 years ($SD = 12$). Eighty percent of the individuals were male. Every client but two scored above "5" on the Michigan Alcoholism Screening Test (MAST), a suggested cut-off point for a diagnosis of alcoholism (Selzer, 1971). The mean and standard deviation on the MAST were 29 and 10, respectively. Thus, an extensive range of alcohol problems was presented. The average daily consumption was 11.5 standard drinks, or approximately 150 grams of absolute alcohol.

Reliability

In the above sample, most of the ADS items were found to have a moderate (.35) to substantial (.70) correlation with the total score. The internal consistency reliability (α) was excellent at .92. Clients are thus consistent (in the sense discussed by Horn, 1971) in responding to the 29 items. Alpha provides a lower bound estimate of the reliability of the total scale in populations from which the items and subjects may be regarded as having been representatively drawn (Lord and Novick, 1968; Horn, 1971; Nunnally, 1978).

Also, reliability estimates for the ADS may be computed from data presented by Wanberg et al. (1977) on the Alcohol Use Inventory. Their sample consisted of 2,261 problem drinkers admitted to short-term inpatient treatment for alcoholism at the Fort Logan Mental Health Center, Denver. Three days of abstinence were required before admission, and the test was given two days after admission. More than 80% were male, and the mean age was 42 years. The average education level was about 11.5 years. Most of the patients (94%) were voluntary admissions. The median internal consistency reliability for the four Alcohol Use Inventory scales that comprise the ADS was: .75 for Obsessive-Compulsive Drinking Style, .79 for

Loss of Behavioral Control, .87 for Psychoperceptual Withdrawal Symptoms, and .72 for Psychophysical Withdrawal Symptoms (Wanberg et al., 1977, Table 4). Given these reliability coefficients and intercorrelations among the four scales (Wanberg et al., 1977, Table 1), one can estimate the reliability of a linear combination of the four scales which form the ADS (Nunnally, 1978, p. 249). The reliability computed this way is .94. This estimate, based on the Fort Logan sample, is virtually identical to the .92 alpha coefficient from the Skinner and Allen (1982) sample.

Using a similar procedure, an estimate of the test-retest reliability of the ADS may be computed. Wanberg et al. (1977, Table 6) present test-retest reliabilities for the Alcohol Use Inventory scales based on 76 patients who were retested after one week of therapy. The corresponding test-retest reliability for the ADS (sum of standard scores for the four Alcohol Use Inventory scales) is .92. Again, this test-retest coefficient is virtually identical to the internal consistency estimates.

Thus, one may have considerable confidence that the ADS will exhibit substantial reliability with individuals who are seeking treatment for their alcohol-related problems. Pending further reliability studies, caution must be exercised when generalizing these reliability estimates to different contexts and populations.

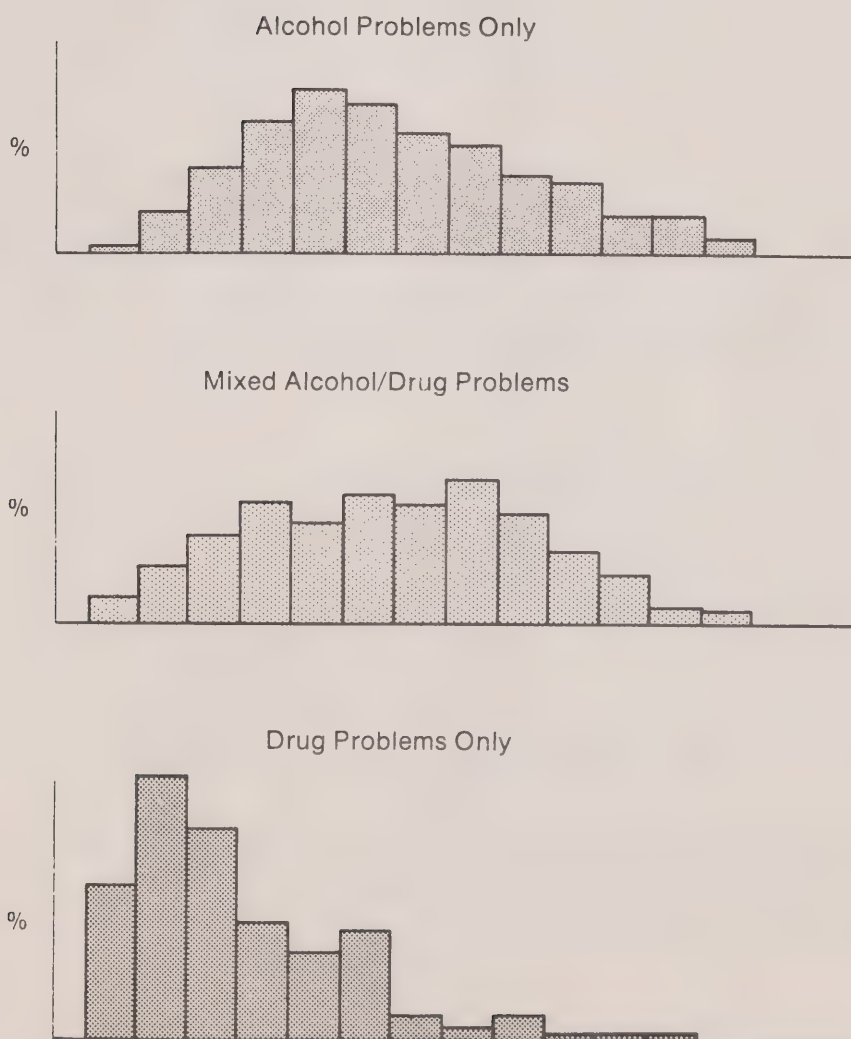
Internal Structure

Factor analysis of intercorrelations among the 29 items indicated a predominant first factor (Skinner and Allen, 1982). This means that the ADS items can be regarded as measuring one factor, even as it is true that this general factor is derived from several lower order factors of the Alcohol Use Inventory. The scale scores on the ADS in this clinical sample conformed quite closely to a normal distribution (skewness and kurtosis were essentially zero). This permits a quantitative interpretation of the syndrome scores. That is, one may interpret ADS scores as ordering individuals along a continuum of increased severity of symptoms related to alcohol dependence. Figure 2 presents the distribution of ADS scores for the Skinner and Allen (1982) sample with alcohol problems, as well as for comparison groups of patients with mixed alcohol/drug problems and with drug-related problems only.

Skinner and Allen (1982) found that the ADS scores correlated at only a low level ($r = -.22$) with a Denial response style. As may be expected, the ADS correlated more strongly ($r = -.51$) with a predilection for reporting socially

FIGURE 2

Distribution of ADS Scores for Three Groups of Clients from the
Clinical Institute, Addiction Research Foundation, Toronto:
Alcohol Problems Only, Mixed Alcohol/Drug Problems,
and Drug Problems Only



desirable characteristics about one's self. However, correlations between the Alcohol Dependence Scale and physical, psychological, and social distress were robust even after the influence of Social Desirability was partialled out. Because the symptoms and behaviors of alcohol dependence are considered undesirable in our society, it is unrealistic to expect to generate items that are neutral in social desirability and yet retain enough clinical relevance to tap the dependence syndrome. Nonetheless, the correlation with Social Desirability demands caution when interpreting the Alcohol Dependence Scale. The alert clinician must remain sensitive to the possibility that individuals who score higher in social desirability may be under-reporting their symptoms of alcohol dependence.

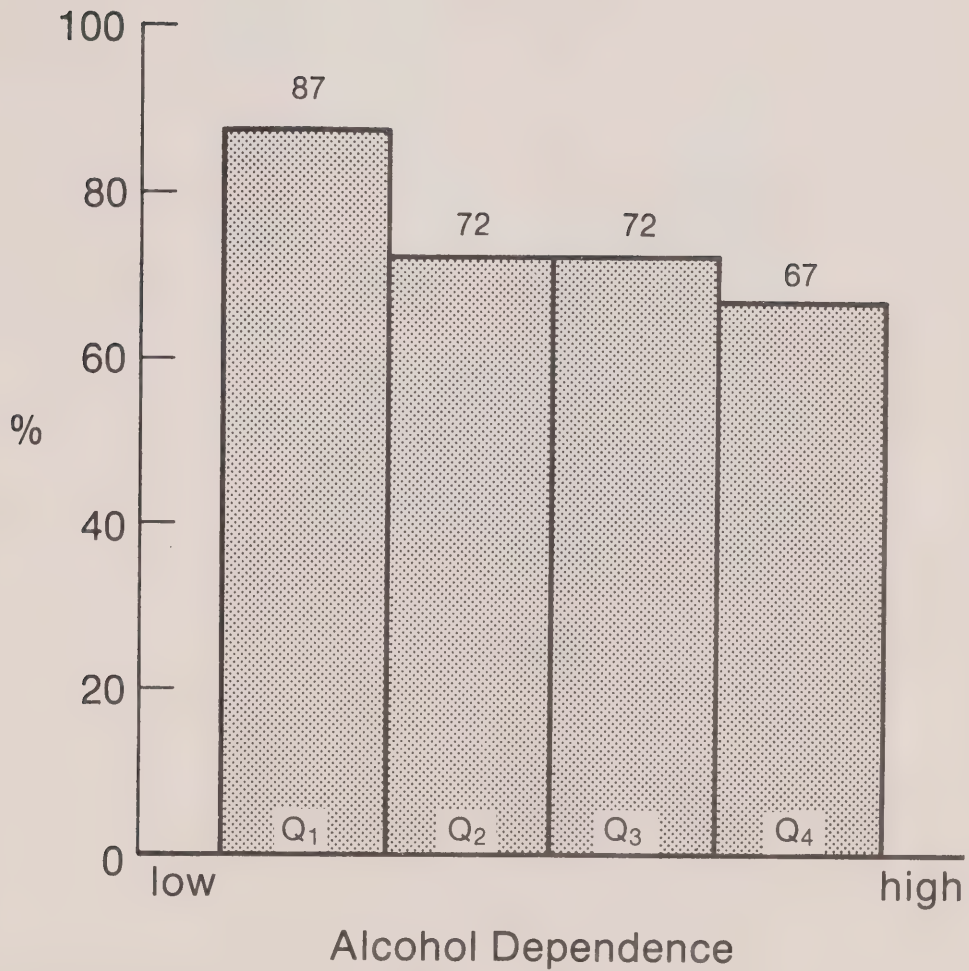
Validity

Several aspects of external validity were examined in the Skinner and Allen (1982) study. It was found that:

1. Clients who scored high on the ADS were less likely to keep their first treatment appointment than were clients who scored low (Figure 3). Research is needed to evaluate strategies for increasing treatment compliance with the non-return clients.
2. Higher levels of alcohol dependence were associated with greater quantities of alcohol consumed and with various problems related to excessive drinking, such as poor social stability, thought disorder, suspiciousness, tension, low self esteem, and physical symptoms (especially in the nervous system). The ADS correlated .69 with the Michigan Alcoholism Screening Test (Selzer, 1971), which provides a good measure of alcohol-related disabilities (Figure 1). Thus, as the scores on the ADS increased, there was greater likelihood of some physical, psychological, and social disability (Tables 1 and 2).
3. When clients scoring high on the ADS were given a medical examination, the most common disorders were digestive (mainly linked to liver disease). Figure 4 depicts the increased prevalence of digestive disorders accompanying increases in level of alcohol dependence.
4. Individuals at lower levels of alcohol dependence felt they could cut down to a few drinks a day, whereas individuals at higher levels increasingly endorsed

FIGURE 3

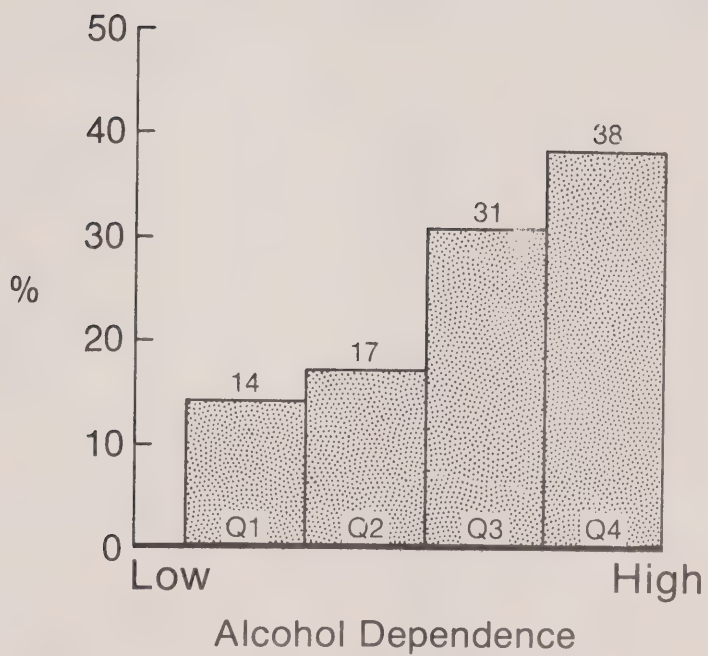
Client Show-Rate for First Treatment Session by Quartiles (Q) on the ADS



Q1 = ADS score of 1 to 13, Q2 = ADS score of 14 to 21,
Q3 = ADS score of 22 to 30, Q4 = ADS score of 31 to 47.

FIGURE 4

Prevalence of Digestive Disorders (Mainly Liver Diseases)
by Quartiles (Q) on the ADS



Q1 = ADS score of 1 to 13, Q2 = ADS score of 14 to 21,
Q3 = ADS score of 22 to 30, Q4 = ADS score of 31 to 47.

Table 1

Correlation of the Alcohol Dependence Scale with
Client Characteristics and Psychopathology

	Zero-Order Correlation	Partialling Out Social Desirability
<u>Demographic Characteristics</u>		
Age	-.07	.06
Sex (1 - M, 2 - F)	-.01	.00
Education Level	-.23**	-.06
Social Stability	-.48**	-.38**
Social Class	-.45**	-.33**
<u>Intellectual Functioning</u>		
Verbal Ability	-.17*	-.08
Digit Symbols	-.16*	-.13*
Benton Visual Retention	-.09	-.05
<u>Basic Personality Inventory</u>		
Hypochondriasis	.45**	.26**
Depression	.44**	.17*
Interpersonal Problems	.28**	.05
Social Deviation	.32**	.08
Persecutory Ideas	.45**	.24**
Anxiety	.44**	.20*
Thinking Disorder	.50**	.32**
Impulse Expression	.44**	.18*
Social Introversion	.25**	.01
Self-Depreciation	.47**	.23**

* $p < .05$

** $p < .001$

Table 2

Correlation of the Alcohol Dependence Scale
with the Cornell Medical Index

CMI Scales	Zero-Order Correlation	Partialling Out Social Desirability
1. Eyes or Ears	.34**	.25*
2. Respiratory	.45**	.31**
3. Cardiovascular	.53**	.37**
4. Digestive Tract	.53**	.36**
5. Musculoskeletal	.44**	.32**
6. Skin	.50**	.34**
7. Nervous System	.60**	.45**
8. Genitourinary	.30**	.20*
9. Fatigability	.46**	.27*
10. Frequency of Illness	.34**	.20*
11. Miscellaneous Diseases	.31**	.31**
12. Habits (sleep, exercise, smoking, caffeine and alcohol consumption)	.60**	.46**
13. Inadequacy	.56**	.36**
14. Depression	.49**	.29*
15. Anxiety	.40**	.27*
16. Sensitivity	.45**	.27*
17. Anger	.56**	.38**
18. Tension	.61**	.46**
Physical Index	.64**	.49**
Psychiatric Index	.62**	.45**

* p < .05

** p < .001

abstinence as the only way to improve (Figure 5). These findings suggest that individuals who score low on the ADS are likely to comply with a controlled drinking program, but might reject a plan that focused on abstinence, whereas those who score high on the ADS are likely to be accepting of, and perhaps even desiring, a firm program of abstinence.

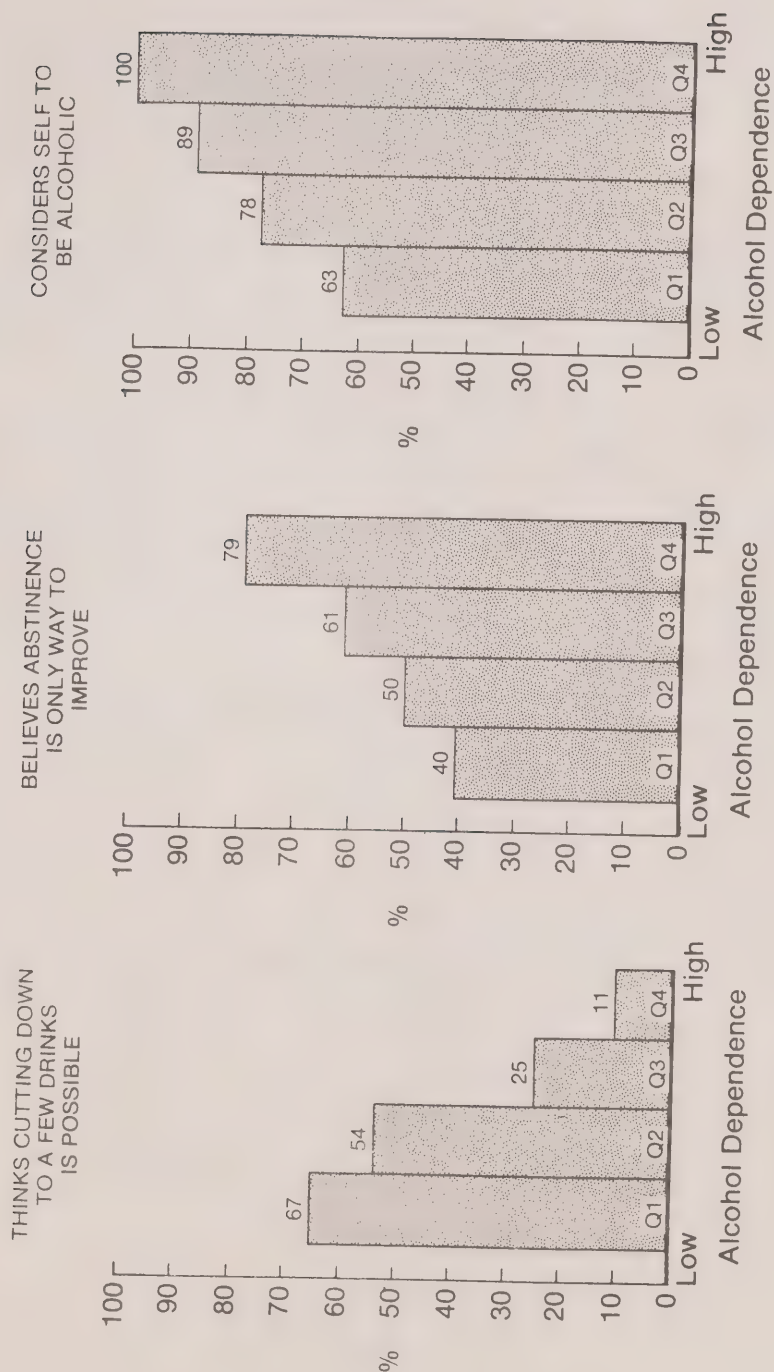
Further evidence on the predictive validity of the ADS is available from a randomized trial of abstinence versus controlled drinking goals conducted at the Clinical Institute (Sanchez-Craig, 1980; Sanchez-Craig et al., 1984). The 70 subjects were carefully selected to represent a sample of socially stable problem drinkers. Following a comprehensive assessment, including a medical examination, subjects were randomly assigned to a goal of either abstinence or controlled drinking. Both groups received a cognitive-behavioral intervention that required approximately six weekly individual sessions. The intervention was identical in the two conditions (teaching self-monitoring and problem-solving skills) except for specific procedures for developing moderate drinking practices in the controlled drinking group.

Most of the 70 subjects scored at low to moderate levels of alcohol dependence as assessed by the ADS (Table 7). This finding reflects the stringent criteria used to select the sample of socially stable problem drinkers. The mean ADS score for this sample was 14.9, which is at the boundary between the first (Q1) and second (Q2) quartile of the alcohol dependence continuum depicted in Figures 3, 4, and 5.

When the acceptability of the randomly assigned treatment goal was examined, Sanchez-Craig (1980) found that 30 subjects (86%) in the controlled drinking group, compared with only 12 subjects (34%) in the abstinence group, accepted the assigned goal (Table 3). Moreover, significant differences were evident in alcohol consumption, measured during the first three weeks of treatment when all subjects were expected to be abstinent. Subjects in the abstinence group drank more frequently and consumed more per day than subjects in the controlled drinking group. The high rate of rejection of abstinence suggests that controlled drinking is a more acceptable treatment goal in a population of socially stable problem drinkers. Individuals at low to moderate levels of alcohol dependence are less likely to comply with treatment when abstinence is the main goal. This result (Sanchez-Craig, 1980) provides empirical support for the predictive validity of the ADS regarding compliance with abstinence versus controlled drinking goals (Figure 5).

FIGURE 5

Response to Drinking Items by Quartiles (Q) on the ADS



Q1 = ADS score of 1 to 13, Q2 = ADS score of 14 to 21,
Q3 = ADS score of 22 to 30, Q4 = ADS score of 31 to 47.

Table 3

Acceptance of Controlled Drinking Versus Abstinence
Goals with Early-Stage Problem Drinkers

TREATMENT CONDITION ASSIGNED	ACCEPTED THE DRINKING GOAL	
	YES	NO
Controlled Drinking (n = 35)	86%	14%
Abstinence (n = 35)	34%	66%
	$\chi^2 = 19.3$	$p < .001$

Source: Sanchez-Craig, M. Addictive Behaviors, 5, 35-39, 1980.

Further analyses using the ADS were conducted with the 35 controlled drinking subjects (Sanchez-Craig, personal communication). (The abstaining group was not used since most of the subjects did not comply with the treatment regime.) The ADS significantly ($p < .05$) differentiated compliers from non-compliers with drinking limits set for the six weeks of formal treatment:

Compliers (n = 16) ADS mean = 16.8, SD = 8.0

Non-Compliers (n = 19) ADS mean = 10.6, SD = 5.7

That is, subjects who scored in the moderate range of alcohol dependence symptoms were more likely to comply with treatment criteria than subjects who scored at a lower level. Presumably, those problem drinkers with a moderate degree of alcohol dependence were more highly motivated and committed to achieving a controlled drinking status. These subjects had more symptoms of alcohol dependence and thus made a more serious attempt to follow the drinking guidelines. Further research on this hypothesis, using other subject and program variables, is needed.

An extensive follow-up assessment was conducted at six, 12, 18, and 24 months after treatment (Sanchez-Craig et al., 1984). When the ADS was correlated with drinking Frequency (days per week) and Quantity (mean drinks per day) for subjects in the controlled drinking condition, an inverse relationship was found for Frequency and suggested for Quantity.

ADS Correlations with:

	<u>Frequency</u>	<u>Quantity</u>
6-month follow-up	-.44	-.25
12-month follow-up	-.44 *	-.18
18-month follow-up	-.46 **	-.20
24-month follow-up	-.43 *	-.05

* $p < .05$

** $p < .01$

Subjects reporting a greater degree of alcohol dependence symptoms during the initial assessment were likely to be drinking less frequently during the two-year follow-up. This inverse relationship with ADS scores parallels the prediction of Compliers versus Non-Compliers during treatment itself.

In review, findings from the controlled drinking project (Sanchez-Craig, 1980; Sanchez-Craig et al., 1984) provide important data on the predictive validity of the ADS. First, subjects at low to moderate levels of alcohol dependence are more likely to accept controlled drinking goals and reject total abstinence. Second, as alcohol dependence increases from a low to moderate level, there is greater

likelihood of compliance with guidelines for controlled drinking during treatment, as well as an increased likelihood of successfully maintaining a controlled status throughout the two-year follow-up. However, these findings pertain only to a carefully selected sample of socially stable problem drinkers who primarily scored within the first two quartiles (84%) on the ADS (low to moderate symptoms). Without further study, these results should not be generalized to individuals reporting a more severe degree of alcohol dependence symptoms. Indeed, from Figure 5 one would predict that individuals in the upper two quartiles (Q3 and Q4) on the ADS would be more likely to accept a goal of abstinence and comply with an abstinence-focused treatment program.

Final Revision to the ADS

Following the Skinner and Allen study (1982), a small revision to the ADS was made. Five new items were written to strengthen content validity with respect to the syndrome described by Edwards and Gross (1976). The new items pertain to impaired control over drinking (2 items), increased tolerance (2 items), and reinstatement of the syndrome following a period of abstinence (1 item). These new items were written to replace five less discriminating items (Alcohol Use Inventory items #9, 54, 96, 117, 131) which go beyond the concept of impaired control over alcohol intake and deal with broader issues of behavioral control problems when drinking (e.g. becoming belligerent, losing control, physically harming others, attempting suicide). An empirical evaluation of the new items was conducted with two independent groups of individuals who sought help for alcohol-related problems:

Sample A from the Clinical Institute.

(n = 169; 91% male; mean age 38 years (SD = 11); 45% single, 25% married, 29% separated/divorced; 50% completed secondary school),

Sample B from an assessment centre in Southwestern Ontario.

(n = 96; 76% male, mean age 33 years (SD = 13); 37% single, 31% married, 28% separated/divorced; 42% completed secondary school).

Initially, an item analysis was conducted separately within each sample. Both analyses indicated that the two tolerance items had poor item total scale correlations. Further analyses revealed that two other items from the original ADS could be eliminated without altering the scale reliability estimate (Table 4). The

original 29-item and the revised 25-item ADS correlated almost perfectly in each sample ($r = .96$ and $r = .99$, respectively). Moreover, the regression equation for predicting the original ADS from the revised 25-item version contained a slope of unity and a negligible intercept (Table 4). These data indicate that, for all practical purposes, the original and revised ADS provide operationally equivalent measures of the alcohol dependence syndrome. The revised ADS is preferred because it is somewhat briefer and the content corresponds more closely to the Edwards and Gross (1976) definition. Thus, the 25-item ADS is recommended for all future applications of the scale.

Table 4

Comparison of Original 29-Item ADS
with Revised 25-Item Version

Regression Analysis* for Predicting Original (y) from Revised (x) ADS	Sample A n = 169	Sample B n = 96
Correlation Coefficient	.96	.99
Slope (b)	.99	1.00
Intercept (a)	.04	-.63
Standard Error of Estimate	2.63	1.65
Reliability Estimate (alpha)		
Original 29-Item ADS	.90	.92
Revised 25-Item ADS	.90	.91

* $y = a + bx$

III. GUIDELINES FOR USE

Administration

The 25-item ADS may be administered in either a questionnaire or interview format. Generally, the ADS should take less than 10 minutes to complete. The questionnaire version is generally preferred because it permits the efficient assessment of large samples in a brief time and with a minimum dollar expense. However, a skilled interviewer giving the ADS may be able to minimize deceptive answers by defensive clients, and probe for more accurate responses from clients who lack insight or have difficulty reading and understanding the questions. Skinner (1981c) discusses the relative merits of different assessment approaches. If it is possible, the ADS should not be administered when a person is under the influence of alcohol (or drugs) or undergoing an alcohol withdrawal reaction. In both cases, the reliability and validity of the ADS would be suspect. Thus, one should ensure that individuals are alcohol-free (detoxified) before the ADS is given.

Detailed instructions for administering the ADS are listed on the questionnaire booklet. Respondents are asked to carefully consider each item and then circle the best response. It is important that every item is answered with only one response. Sometimes this may be difficult because more than one answer may apply or because no answer is just right. In each case of this kind, the respondent should give the "best" answer (i.e. agrees with most of the time).

Scoring

Table 5 lists the scoring key for all 25 items on the ADS. Corresponding to each response option is a number. For example, item #1 (How much did you drink the last time you drank?) has three response options:

Key

- | | | |
|---|----|----------------------------|
| 0 | a. | Enough to get high or less |
| 1 | b. | Enough to get drunk |
| 2 | c. | Enough to pass out |

The scoring key for this item from Table 5 is depicted above. If the respondent circled option "a" then the score would be "0." Similarly, response "b" if chosen would be scored "1" and response "c" would be scored "2." All 25 items should be scored in such a manner. The total Alcohol Dependence Scale score is then computed by summing scores from the 25 items. Normative data for interpreting

the ADS total score are given in Tables 6 to 8. In review, the ADS score is computed by two steps:

1. Score each item using the key (Table 5)
2. Sum item scores for the 25 items to yield the total ADS score.

The ADS total score can range from 0 to 47.

Interpretation

The direct numerical sum of items on the ADS is called a raw score. This score can range from 0 to 47--a higher ADS raw score corresponds to a greater number of dependence symptoms reported. However, raw scores can be easily misinterpreted. A better understanding is afforded by comparing a given individual's score with the performance of other persons from an appropriate reference group or normative sample. In this way, one may interpret an individual's level of alcohol dependence relative to the normative group.

One way to make comparisons is to rank ADS raw scores from highest to lowest. A percentile score is the rank expressed in percentage terms. Thus, a person's percentile score reveals what proportion of the normative group falls below him or her. In large samples, the distribution of percentile scores is nearly rectangular--persons near the middle of the raw score scale are spread apart; persons at the end are squeezed together.

A second useful way to compare an individual's performance with a normative group is to compute a standard score. That is, the mean for the normative sample is subtracted from the person's raw score, and this value is divided by the standard deviation (spread of scores) of the normative sample. The resulting standard scores (actually Z scores) have a mean of zero ($SD = 1$) in the normative group. To avoid negative numbers, it is convenient to rescale the values to standard T scores that set the mean at 50 and standard deviation at 10. Accordingly, a standard T score less than 50 is below the normative group mean; a standard T score higher than 50 is greater than the normative group average. When the scores are normally distributed (as in the case of the ADS), approximately 67% of T scores will fall in the range of 40 to 60. Both percentile and standard T scores are given in Tables 7 and 8 for different normative groups described in Table 6.

The question of which normative group is most appropriate depends on the particular assessment context and the type of decisions that will be made. In many settings, one may want to administer the ADS to a representative sample,

Table 5

ADS Scoring Key

Item Option Score			Item Option Score			Item Option Score		
1	a	0	10	a	0	19	a	0
	b	1		b	1		b	1
	c	2		c	2		c	2
				d	3			
2	a	0	11	a	0	20	a	0
	b	1		b	1		b	1
				c	2		c	2
3	a	0	12	a	0	21	a	0
	b	1		b	1		b	1
	c	2		c	2		c	2
4	a	0	13	a	0	22	a	0
	b	1		b	1		b	1
	c	2		c	2		c	2
							d	3
5	a	0	14	a	0	23	a	0
	b	1		b	1		b	1
	c	2		c	2		c	2
6	a	0	15	a	0	24	a	0
	b	1		b	1		b	1
	c	2						
7	a	0	16	a	0	25	a	0
	b	1		b	1		b	1
	c	2		c	2			
				d	3			
8	a	0	17	a	0			
	b	1		b	1			
	c	2		c	2			
9	a	0	18	a	0			
	b	1		b	1			

Table 6
Descriptive Statistics for the Normative Samples

	Alcohol Problem Clients N = 225	Controlled Drinking N = 70	Outpatient Counseling N = 150	Inpatient N = 100
<u>ADS Statistics</u>				
mean	23	14	19	28
standard deviation	11	7	10	11
median	22	14	18	28
range	1 - 47	2 - 37	2 - 44	7 - 47
skewness	0.36	0.68	0.40	0.00
kurtosis	-0.74	0.45	-0.46	-0.90
<u>SAMPLE STATISTICS</u>				
<u>Age</u>				
mean	38	35	37	41
standard deviation	12	10	10	9
<u>Sex</u>				
% male	80	74	78	84
<u>Education Years</u>				
mean	10	14	12	10
standard deviation	3	3	3	3
<u>Marital Status</u>				
% married/common-law	29	36	47	12
% single	29	47	23	26
% separated/divorced widowed	42	17	30	62
<u>MAST</u>				
mean	29	19	26	34
standard deviation	10	6	10	7
<u>Present Daily Average</u>				
<u>Alcohol Consumption</u>				
mean (drinks*)	11	7	8	15
standard deviation	11	5	8	13

* One standard drink = 13.6 g ethanol

Table 7

ADS Normative Data Based on 225 Clients
Presenting with Alcohol Problems (Skinner and Allen, 1982)

<u>ADS Raw Score</u>	<u>Standard (T) Score</u>	<u>Percentile</u>
0	29	0
1	30	0
2	31	0
3	32	0
4	33	2
5	34	5
6	35	5
7	36	6
8	37	7
9	37	11
10	38	16
11	39	17
12	40	21
13	41	24
14	42	28
15	43	30
16	44	35
17	45	38
18	45	42
19	46	44
20	47	47
21	48	49
22	49	51
23	50	56
24	51	58
25	52	62
26	53	65
27	53	69
28	54	72
29	55	74
30	56	74
31	57	76
32	58	77
33	59	78
34	60	81
35	61	83
36	61	85
37	62	88
38	63	89
39	64	90
40	65	91
41	66	92
42	67	94
43	68	95
44	69	96
45	69	98
46	70	98
47	71	99

Table 8

ADS Normative Data for Selected Treatment Programs

ADS Raw Score	Controlled Drinking		Outpatient Counseling		Inpatient	
	Standard (T)	Percentile	Standard (T)	Percentile	Standard (T)	Percentile
0	30	0	31	0	25	0
1	31	0	32	0	25	0
2	33	1	33	1	26	0
3	34	1	34	3	27	0
4	36	4	35	4	28	0
5	37	4	36	7	29	0
6	39	15	37	9	30	0
7	40	22	38	13	31	1
8	41	28	39	17	32	1
9	43	32	40	18	33	2
10	44	38	41	23	34	5
11	46	39	42	23	35	6
12	47	45	43	25	35	10
13	49	48	44	29	36	12
14	50	52	45	34	37	13
15	51	58	46	41	38	13
16	53	67	47	46	39	17
17	54	71	48	49	40	19
18	56	77	49	56	41	21
19	57	80	50	58	42	23
20	59	81	51	62	43	28
21	60	84	52	64	44	30
22	61	87	53	67	45	32
23	63	91	54	70	45	37
24	64	91	55	71	46	41
25	66	93	56	74	47	42
26	67	94	57	77	48	45
27	69	96	58	80	49	49
28	70	97	59	81	50	54
29	71	97	60	85	51	56
30	73	97	61	87	52	57
31	74	99	62	89	53	58
32	76	99	63	89	54	61
33	77	99	64	93	55	64
34	79	99	65	95	55	68
35	80	99	66	95	56	73
36	81	99	67	97	57	77
37	83	99	68	97	58	82
38	84	99	69	97	59	83
39	86	99	70	98	60	85
40	87	99	71	98	61	85
41	89	99	72	99	62	88
42	90	99	73	99	63	90
43	91	99	74	99	64	92
44	93	99	75	99	65	93
45	94	99	76	99	65	96
46	96	99	77	99	66	97
47	97	99	78	99	67	99

whereupon the ADS scores of new individuals can be compared to this reference group. For instance, one could say that relative to typical clients seen at this treatment centre, a particular individual reported a "low" (moderate or high) degree of alcohol dependence symptoms. Since no single normative sample would be appropriate for the variety of settings where the ADS might be used, normative data are given for four groups that differ in background characteristics, range of alcohol problems, and treatment program assigned (Table 6). All groups are from the Clinical Institute of the Addiction Research Foundation, Toronto.

1. Alcohol Problems Sample (Table 7). The first normative group is the Skinner and Allen (1982) sample, which is representative of ambulatory clients who are seeking help for their alcohol-related problems, at a specialized treatment centre for addictions. An extensive range of alcohol problems is apparent from the wide distribution of scores on the Michigan Alcoholism Screening Test. Clients had been drinking for an average of 20 years, with a range from one to 49 years. Not one reported a cross addiction to drugs. Thus, Table 6 allows the comparison of ADS scores against a fairly heterogeneous sample of clients being assessed on an outpatient basis. In contrast, normative data for three, more highly selected groups are provided in Table 7.

2. Controlled Drinking Sample (Table 8). This group represents 70 socially stable problem drinkers who were carefully selected for the randomized trial of abstinence versus controlled drinking goals (Sanchez-Craig, 1980). Criteria for participation in this study included: average or above average intelligence, no evidence of physical pathology (e.g. liver or brain damage), non-participation in Alcoholics Anonymous, non-subscription to the disease concept of alcoholism, less than 10 years of problem drinking, no recent period of self-produced abstinence lasting six months or more, maintenance of a job and stable family contact, and provision of two collaterals willing to report on the subject's progress. As expected, early stage problem drinkers reported a lower range of alcohol dependence symptoms than the other normative groups.

3. Outpatient Counseling Sample (Table 8). This group consisted of 150 clients who, following assessment, were assigned to individual counseling on an outpatient basis. Therapy was provided by a social worker who met with the client on a weekly basis for a duration of up to six months. The sessions focused on increasing the client's problem-solving skills and self-awareness. Selection criteria included at least a low-average level of intelligence and moderate-to-good social stability in order to sustain treatment on an outpatient basis.

4. Inpatient Sample (Table 8). The 100 clients in this normative group were assigned following assessment to either an inpatient alcoholism program ($n = 63$) or a halfway house ($n = 37$). Since the ADS mean and standard deviation were virtually identical for the two programs, they were combined into one sample. The alcoholism program was a relatively traditional inpatient service consisting of group therapy. The halfway house offered a similar program of services. Clients were excluded if they had complicating medical problems, major psychiatric disorders, legal charges pending, or a similar treatment program within the previous six months. This group had the most severe history of alcohol abuse among the normative samples (Table 6), which is reflected in the prevalence of higher ADS scores. However, even greater levels of alcohol dependence symptoms might be found among individuals at a detox centre or among inpatients admitted to a medical ward for such an alcohol-related pathology as liver disease.

Figure 6 depicts the ADS raw score mean and standard deviation for the four normative groups. Basically, there is a linear progression in the degree of alcohol dependence from the socially stable problem drinkers (controlled drinking sample), through the outpatient counseling and inpatient groups. In all four groups, the ADS was not correlated with either age or sex. Table 2 lists these data for the Skinner and Allen (1982) sample. Similarly, correlations using the other three samples were all nonsignificant. Thus, there would appear to be no need for age-adjusted or sex-adjusted norms in Tables 7 and 8.

Based on the four normative samples and research conducted to date, guidelines for interpreting the ADS are summarized in Table 9. These guidelines will be updated as research progresses on the ADS.

Caution: A low ADS score does not necessarily mean that the individual is free of alcohol dependence symptoms. One must be wary of individuals who are defensive or who are attempting to present a socially desirable picture. These response style biases might be more problematic in contexts where the person has important consequences resting on the assessment, such as in the criminal justice system or an employment setting. Also, attention must be given to the number of years the person has been drinking, time since last drinking, use of drugs other than alcohol, the person's age and sex, as well as other pertinent information. ADS scores should always be corroborated with data from other sources before making a treatment plan.

FIGURE 6

ADS Raw Score Mean (Top of Box) and Standard Deviation (Vertical Line)
for the Different Normative Groups

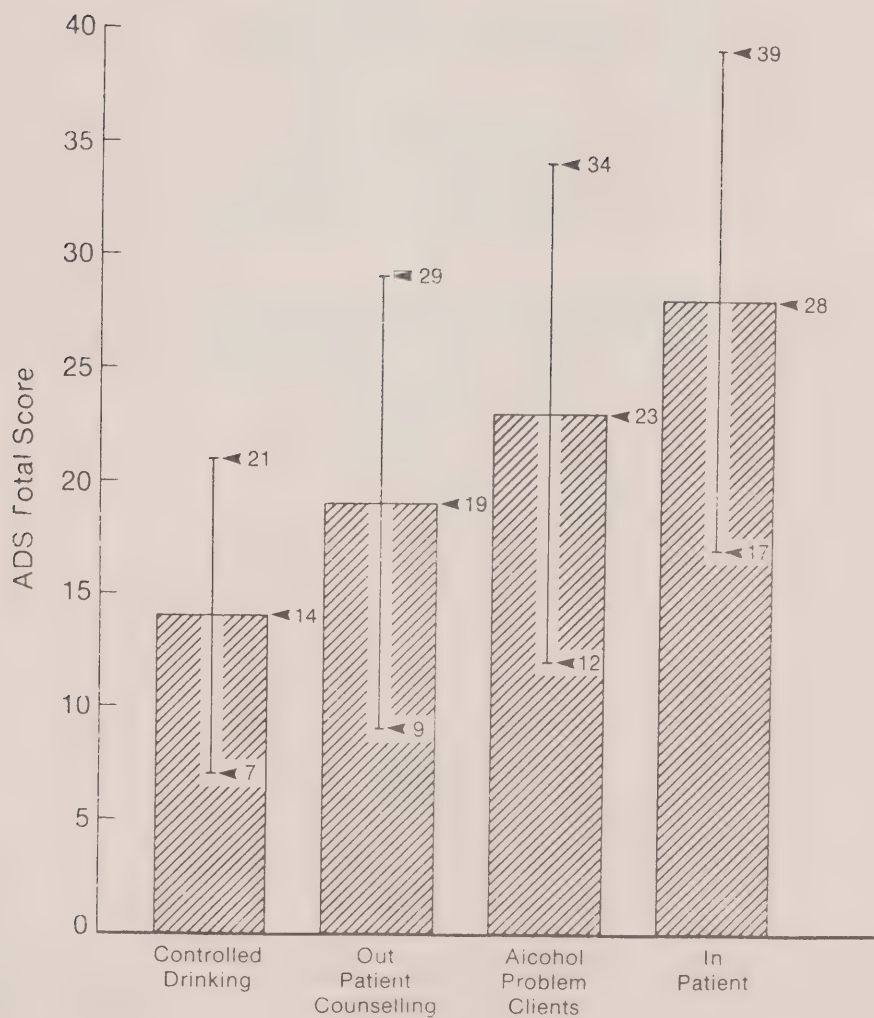


Table 9

ADS Interpretation Guide

<u>ADS Raw Score</u>	<u>Suggested Interpretation</u>
0	<u>No Evidence</u> of alcohol dependence was reported.
1 - 13 (1st quartile)	<u>Low Level</u> of alcohol dependence. Such dependence as exists is probably psychological, rather than physical. Controlled drinking strategies may be of use if there are no contra-indications. Clients are more likely to comply with controlled drinking and reject abstinence goals. Check for seriousness of intentions to comply with treatment.
14 - 21 (2nd quartile)	<u>Moderate Level</u> of alcohol dependence. Psychosocial problems related to drinking are likely. Psychological dependence may still be characteristic, but look for signs of physical dependence and withdrawal symptoms. Controlled drinking strategies may be considered if there are no contraindications. Clients may be more likely to comply with controlled drinking and reject abstinence goals.
22 - 30 (3rd quartile)	<u>Substantial Level</u> of alcohol dependence. Physical dependence is likely. Physical disorders and psychosocial problems related to alcohol abuse are probable. Abstinence treatment goals should be very seriously considered. Clients may be more likely to recognize that abstinence is the only way to improve.
31 - 47 (4th quartile)	<u>Severe Level</u> of alcohol dependence. Physical dependence is highly likely. Serious physical disorders related to drinking--such as liver disease--are likely. Abstinence is probably the only reasonable treatment goal. Clients should generally agree with total abstinence as the focus of treatment.

Advantages of the ADS

1. The scale has a theoretical grounding -- that is, it is linked to an underlying concept (alcohol dependence syndrome) which, in turn, is related to multiple factor theories of alcohol use and abuse.
2. The ADS provides a quantitative index of the severity of alcohol dependence.
3. The ADS is brief and inexpensive to administer.
4. Research has shown the ADS to have good reliability and validity properties. Normative data are available from various outpatient and inpatient samples.
5. The ADS may be used as both a research and clinical diagnostic tool.

Limitations of the ADS

1. Since the content of the ADS is obvious, individuals may fake results or minimize the severity of their problems.
2. There is danger that the ADS may be misinterpreted or be given too much weight.
3. Further research is needed to establish empirically-based rules for making treatment planning decisions.

Future Studies

The Alcohol Dependence Scale is part of an ongoing program of evaluation with various clinical and non-clinical populations. A comparative study is planned between the Alcohol Dependence Scale and other techniques for assessing the dependence syndrome, including self-report (Stockwell et al., 1979), clinical interview (Chick, 1980a), and behavioral measurement (Rankin et al., 1980). Further research is needed on the predictive validity of the syndrome with respect to differential treatment outcomes. In particular, the prognostic value of the ADS should be corroborated regarding treatment goals of abstinence versus controlled drinking. This ongoing program of research is aimed at refining the theoretical concept of alcohol dependence, as well as its measurement and predictive utility (Skinner, 1981d). Another line of research will compare psychometric properties of questionnaire and computerized versions of the ADS (e.g., Skinner and Allen, 1983).

Availability

The 25-item Alcohol Dependence Scale and related material are available from the Addiction Research Foundation, Marketing Services, Department 897, 33 Russell Street, Toronto, Ontario, Canada, M5S 2S1; telephone (416) 595-6056. The

ADS is available in two formats: questionnaire and computerized interview. The questionnaire version may be administered in an individual or group setting, and then easily scored by hand. The computerized version allows the on-line testing of an individual at a computer terminal, followed by immediate feedback of results from both the terminal monitor and hard copy printer. A computer software package is available for microcomputers compatible with the IBM Personal Computer.

The 147-item Alcohol Use Inventory and related material are available from Psych Systems, 600 Reisterstown Road, Baltimore, Maryland, USA, 21208.

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CA 2 ON
H 85
- 84 A 42

NAME: _____

DATE: _____

ALCOHOL USE QUESTIONNAIRE (ADS)

19
1984

The questions in this booklet are about your
use of alcohol during the *past 12 months*.

INSTRUCTIONS

1. Carefully read each question and the possible answers provided. Answer each question by circling the ONE choice that is most true for you.
2. The word "drinking" in a question refers to "drinking of alcoholic beverages."
3. Take as much time as you need. Work carefully, and try to finish as soon as possible. Please answer ALL questions.

If you have difficulty with a question or have
any problems, please ask the questionnaire
administrator.

These questions refer to the past 12 months

1. How much did you drink the last time you drank?
 - a. Enough to get high or less
 - b. Enough to get drunk
 - c. Enough to pass out

2. Do you often have hangovers on Sunday or Monday mornings?
 - a. No
 - b. Yes

3. Have you had the “shakes” when sobering up (hands tremble, shake inside)?
 - a. No
 - b. Sometimes
 - c. Almost every time I drink

4. Do you get physically sick (e.g. vomit, stomach cramps) as a result of drinking?
 - a. No
 - b. Sometimes
 - c. Almost every time I drink

5. Have you had the “DTs” (delirium tremens) — that is, seen, felt or heard things not really there; felt very anxious, restless, and over-excited?
 - a. No
 - b. Once
 - c. Several times

PAGE TWO

6. When you drink, do you stumble about, stagger, and weave?
 - a. No
 - b. Sometimes
 - c. Often
7. As a result of drinking, have you felt overly hot and sweaty (feverish)?
 - a. No
 - b. Once
 - c. Several times
8. As a result of drinking, have you seen things that were not really there?
 - a. No
 - b. Once
 - c. Several times
9. Do you panic because you fear you may not have a drink when you need it?
 - a. No
 - b. Yes
10. Have you had blackouts ("loss of memory" without passing out) as a result of drinking?
 - a. No, never
 - b. Sometimes
 - c. Often
 - d. Almost every time I drink

PAGE THREE

11. Do you carry a bottle with you or keep one close at hand?
- a. No
 - b. Some of the time
 - c. Most of the time
12. After a period of abstinence (not drinking), do you end up drinking heavily again?
- a. No
 - b. Sometimes
 - c. Almost every time
13. In the past 12 months, have you passed out as a result of drinking?
- a. No
 - b. Once
 - c. More than once
14. Have you had a convulsion (fit) following a period of drinking?
- a. No
 - b. Once
 - c. Several times
15. Do you drink throughout the day?
- a. No
 - b. Yes

MORE 

PAGE FOUR

16. After drinking heavily, has your thinking been fuzzy or unclear?

- a. No
- b. Yes, but only for a few hours
- c. Yes, for one or two days
- d. Yes, for many days

17. As a result of drinking, have you felt your heart beating rapidly?

- a. No
- b. Once
- c. Several times

18. Do you almost constantly think about drinking and alcohol?

- a. No
- b. Yes

19. As a result of drinking, have you heard "things" that were not really there?

- a. No
- b. Once
- c. Several times

20. Have you had weird and frightening sensations when drinking?

- a. No
- b. Once or twice
- c. Often

MORE —————→

21. As a result of drinking, have you "felt things" crawling on you that were not really there (e.g. bugs, spiders)?
- a. No
 - b. Once
 - c. Several times
22. With respect to blackouts (loss of memory):
- a. Have never had a blackout
 - b. Have had blackouts that last less than an hour
 - c. Have had blackouts that last for several hours
 - d. Have had blackouts that last for a day or more
23. Have you tried to cut down on your drinking and failed?
- a. No
 - b. Once
 - c. Several times
24. Do you gulp drinks (drink quickly)?
- a. No
 - b. Yes
25. After taking one or two drinks, can you usually stop?
- a. Yes
 - b. No

